

Technical Memo

To: Bob Gibson – General Electric Company

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Re: Anomalous Lead Results observed in the Phase 1 Hudson River Remedial Action Monitoring Program

As part of the Phase 1 Hudson River Remedial Action Monitoring Program (RAMP), several filtered near-field water monitoring samples have had reported dissolved lead results that are significantly greater than the corresponding total lead results. As defined in Phase 1 Remedial Action Monitoring Program (RAMP) Standard Operating Procedure (SOP) for data validation of ICP/MS metals data [DV200.8, Phase 1 RAMP Quality Assurance Project Plan (QAPP) Appendix 63], the data usability criteria when the dissolved result is greater than the corresponding total result are limits of \pm reporting limit (RL) if at least one result is $<10\times$ RL or a percent difference $<10\%$ if both results are $\geq 10\times$ RL. In addition, when the dissolved metal result is substantially greater than the corresponding total metal result (if at least one result is $<10\times$ RL and the difference is $>5\times$ RL, or if both results are $\geq 10\times$ RL and the percent difference is $>50\%$), the positive and/or “not-detected” results for the total and dissolved metal should be considered unusable (qualified “R” or “UR,” respectively) in the associated sample in accordance with SOP DV200.8.

The lead results for samples where the dissolved lead results are substantially greater than the corresponding total lead results are presented in Table 1 (all total lead results were $<10\times$ the lead RL of 1.0 $\mu\text{g/L}$ and, when the dissolved lead result was greater than the total lead result, the difference between the dissolved lead result and corresponding total lead result was $>5\times$ RL). These lead analyses were performed at the Test America – Pittsburgh facility. In addition, two of the sets of unfiltered/filtered samples were part of a field duplicate pair (WNF-BDUP-090614-JT004/WNF-BDUP-090614-JD001 are field duplicates of WNF-S003-090614-JT001/WNF-S003-090614-JD001 and WNF-BDUP-090625-FT002/WNF-BDUP-090625-FD001 are field duplicates of WNF-TRAN-090625-FT004/WNF-TRAN-090625-FD001) and therefore, these associated field duplicate results are also presented in Table 1. The dissolved lead results in the corresponding field duplicate samples to samples WNF-S003-090614-JD001 (6.4 $\mu\text{g/L}$) and WNF-BDUP-090625-FD001 (6.4 $\mu\text{g/L}$),

WNF-BDUP-090614-JD001 (0.16 UB µg/L) and WNF-TRAN-090625-FD001 (0.092 UB µg/L), respectively, also are inconsistent with the elevated dissolved lead results.

Table 1. Samples with Dissolved Lead Results Substantially Greater than the Corresponding Total Lead Results

Sample	Collection Date(s)	Location	Type	total or dissolved	Lead (ug/L)
WNF-S003-090614-JT001	6/13-14/2009	Rogers Island-West Channel:4	300m Downstream Buoy	total	0.24 UB
WNF-S003-090614-JD001	6/13-14/2009	Rogers Island-West Channel:4	300m Downstream Buoy	dissolved	6.4 J
WNF-BDUP-090614-JT004 (duplicate of WNF-S003-090614-JT001)	6/13-14/2009	Rogers Island-West Channel:4	300m Downstream Buoy	total	0.38 UB
WNF-BDUP-090614-JD001 (duplicate of WNF-S003-090614-JD001)	6/13-14/2009	Rogers Island-West Channel:4	300m Downstream Buoy	dissolved	0.16 UB
WNF-TRAN-090620-GT008	6/20/2009	Lock 7:1	300m Downstream Transect	total	0.25 J
WNF-TRAN-090620-GD003	6/20/2009	Lock 7:1	300m Downstream Transect	dissolved	6.0
WNF-S004-090625-JT001	6/24-25/2009	Rogers Island-West Channel:3	300m Downstream Buoy	total	0.091 UB
WNF-S004-090625-JD001	6/24-25/2009	Rogers Island-West Channel:3	300m Downstream Buoy	dissolved	45.4
WNF-TRAN-090625-FT004	6/25/2009	Rogers Island-West Channel:3	300m Downstream Transect	total	0.16 UB
WNF-TRAN-090625-FD001	6/25/2009	Rogers Island-West Channel:3	300m Downstream Transect	dissolved	0.092 UB
WNF-BDUP-090625-FT002 (duplicate of WNF-TRAN-090625-FT004)	6/25/2009	Rogers Island-West Channel:3	300m Downstream Transect	total	0.17 UB
WNF-BDUP-090625-FD001 (duplicate of WNF-TRAN-090625-FD001)	6/25/2009	Rogers Island-West Channel:3	300m Downstream Transect	dissolved	6.4 J

Based on the fact that the associated total lead results are significantly lower than these elevated dissolved lead results and that the dissolved lead results in the corresponding samples of the two field duplicate pairs are also inconsistent with the elevated dissolved lead results, the elevated dissolved lead results for samples WNF-S003-090614-JD001, WNF-TRAN-090620-GD003, WNF-S004-090625-JD001, and WNF-BDUP-090625-FD001 appear to be external contamination. However, the associated laboratory method blanks and field filter blanks did not reveal any significant contamination that is comparable to these elevated dissolved lead results. In addition, the highest lead result observed in the field filter blanks collected to date is 0.29 µg/L and therefore, the field filter blanks are not indicative of random contamination during field filtration. The laboratory performed confirmation analyses of the most recent high dissolved lead results (45.4 µg/L in sample WNF-S004-090625-JD001 and

6.4 µg/L in sample WNF-BDUP-090625-FD001). Similar dissolved lead results were observed when the laboratory reanalyzed the sample digests as well as analyzed the undigested samples directly from the sample bottles. These analyses confirmed that the lead was presented in the sample bottles for samples WNF-S004-090625-JD001 and WNF-BDUP-090625-FD001 and that external contamination was not introduced during the digestion or analysis of these samples. Other possible sources of contamination were investigated through discussions with laboratory and field personnel and the source of the external contamination is unknown at this time.

As directed by SOP DV200.8, the total and dissolved lead results for samples WNF-S003-090614-JT001, WNF-S003-090614-JD001, WNF-TRAN-090620-GT008, WNF-TRAN-090620-GD003, WNF-S004-090625-JT001, WNF-S004-090625-JD001, WNF-BDUP-090625-FT002, and WNF-BDUP-090625-FD001 should be considered unusable (qualified "R"/"UR" in the database).

